APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,177	03/29/2004	Keisuke Inoue	SCEI 3.0-170	3379

530 7590 05/03/2007	EXAMINER
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ART UNIT	PAPER NUMBER
2128	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/812,177	INOUE, KEISUKE
	Examiner	Art Unit	
	Saif A. Alhija	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>29 March 2004</u>.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-89</u> is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1-89</u> is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on <u>29 March 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>See Continuation Sheet</u>.

4) ☒ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. <u>20070418</u>.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

U.S. Patent and Trademark Office
PTOL-326 (Rev. 08-06)   Office Action Summary   Part of Paper No./Mail Date 20070418

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :1/16/07, 5/22/06, 5/8/06, 9/23/05, 6/25/04.

DETAILED ACTION

1.   Claims 1-89 have been presented for examination.

Information Disclosure Statement

2.   The information disclosure statements (IDS) submitted on 16 January 2007, 22 May 2006, 8 May 2006, 23

September 2005, and 25 June 2004 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the

Examiner has considered the IDS' as to the merits.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

MPEP 2106 recites:

The claimed invention as a whole must accomplish a practical application. That is, it must produce a

"useful, concrete and tangible result" State Street 149 F.3d at 1373, 47 USPQ2d at 1601-02. A process that consists

solely of the manipulation of an abstract idea is not concrete or tangibles. See In re Warmerdam, 33 F.3d 1354,

1360, 31 USPQ2d 1754, 1759 (Fed.Cir. 1994). See also Schrader, 22 F.3d at 295, 30 USPQ2d at 1459.

3.   Claims 1-12, 24-34, and 53-63 are rejected under 35 U.S.C. 101 because the claimed invention is directed

to non-statutory subject matter.

i)   Claim 1 recites providing, associating, and scheduling operations. Therefore the claim does not

produce a useful, concrete, and tangible result. The resultant of the claims is neither stored, nor provided to a user,

etc., for example, and therefore does not contain a concrete and tangible result.

ii)   Claim 24 recites a computing device with a plurality of associated operations. The association of

operations appears to be mere data manipulation and therefore the claims do not produce a useful, concrete, and

tangible result.

iii)   With respect to claims 1-12, 24-34, and 53-63, paragraph 74 of the instant application recites,

"The compiler may be implemented in software, firmware, hardware or a combination of the above." Therefore the

claimed limitations may be entirely software and are therefore non-statutory since "software per se" does not fall

under an approved statutory category.

Appropriate correction is required.

All claims dependent upon a rejected base claim are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming
the subject matter which the applicant regards as his invention.

4.   **Claims 1-89 are rejected** under 35 U.S.C. 112, second paragraph, as being indefinite for failing to

particularly point out and distinctly claim the subject matter which applicant regards as the invention.

i)   Claims 1-89 are rejected by virtue of undue multiplicity. Section 2173.05(n) of the MPEP states

"37 CFR 1.75. Claim(s). (a) The specification must conclude with a claim particularly pointing out and distinctly

claiming the subject matter which the applicant regards as his invention or discovery. (b) More than one claim may

be presented provided they differ substantially from each other and are not unduly multiplied. Where, in view of the

nature and scope of applicant's invention, applicant presents an unreasonable number of claims which are

repetitious and multiplied, the net result of which is to confuse rather than to clarify, a rejection on undue

multiplicity based on 35 U.S.C. 112, second paragraph, may be appropriate. As noted by the court in In re

Chandler, 319 F.2d 211, 225, 138 USPQ 138, 148 (CCPA 1963), "applicants should be allowed reasonable latitude

in stating their claims in regard to number and phraseology employed. The right of applicants to freedom of choice

in selecting phraseology which truly points out and defines their inventions should not be abridged. Such latitude,

however, should not be extended to sanction that degree of repetition and multiplicity which beclouds definition in a

maze of confusion. The rule of reason should be practiced and applied on the basis of the relevant facts and

circumstances in each individual case." See also In re Flint, 411 F.2d 1353, 1357, 162 USPQ 228, 231 (CCPA

1969)."

The 89 claims and 11 independent claims contain limitations from multiple embodiments that are assorted

into multiple different independent claims in an unclear manner and result in a "maze of confusion." The Examiner

contacted Applicants representative, Andrew Zidel, Reg No. 45,256, to allow Applicants the opportunity to provide

a preliminary amendment to resolve the undue multiplicity. Applicants representative elected claims 1-12, 24-34,

and 53-63 to be examined. See attached Interview Summary.

ii)   Claim 2 contains apparent means for language, by stating "temperature sensing means". This does

not comport to U.S. practice, as "means for" claims are separate from method claims.

Appropriate correction is required.

All claims dependent upon a rejected base claim are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the

rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public
use or on sale in this country, more than one year prior to the date of application for patent in the United
States.

5.   **Claims 1-12, 24-34, and 53-63 are rejected** under 35 U.S.C. 102(b) as being clearly anticipated by

Chauvel et al. "Temperature Field Controlled Scheduling for Processing Systems", U.S. Patent Application

No. 2002/0065049.

Regarding Claim 1:

The reference discloses A method of scheduling operations to be performed by a component having a

thermal threshold comprising:

providing a plurality of operations to be performed by the component; (**Abstract. Figure 11. Paragraph**

52)

associating the operations with a thermal attribute, the thermal attribute representing a value related to a

heat amount expected to be generated or incurred by the component during performance of the operations;

(**Abstract. Figure 11. Paragraph 52)**

and scheduling the operations in an order of performance based on the thermal attribute so that the thermal

threshold is not exceeded. (**Abstract. Figure 11. Paragraph 52)**

Regarding Claim 2:

The reference discloses The method of claim 1, further comprising measuring the thermal attribute with a temperature sensing means. **(Paragraph 53, Temperature Measurement)**

Regarding Claim 3:

The reference discloses The method of claim 1, further comprising estimating the thermal attribute based upon power consumption of the component. **(Paragraph 3)**

Regarding Claim 4:

The reference discloses The method of claim 3, wherein estimating the thermal attribute further includes performing a circuit simulation of the component. **(Paragraph 35, "experimentally or by computer aided software design.")**

Regarding Claim 5:

The reference discloses The method of claim 3, wherein estimating the thermal attribute further includes determining a power density of the component. **(Paragraph 29, "power management tasks")**

Regarding Claim 6:

The reference discloses The method of claim 1, further comprising the component executing the operations in the order of performance. **(Paragraph 32)**

Regarding Claim 7:

The reference discloses The method of claim 6, wherein the component includes a plurality of processing devices and the thermal attribute is an aggregate thermal attribute of selected ones of the processing devices that execute the operations. **(Claim 1)**

Regarding Claim 8:

The reference discloses The method of claim 1, wherein the component includes a plurality of processing devices, each of the processing devices has an individual thermal threshold, and the thermal attribute includes a plurality of individual thermal attributes, each individual thermal attribute being associated with one of the processing devices. **(Claim 1)**

Regarding Claim 9:

The reference discloses The method of claim 8, further comprising:

selecting at least some of the processing devices to execute the operations; **(Figure 3a-3b. Paragraph 34-35)**

monitoring the selected processing devices; **(Figure 3a-3b. Paragraph 34-35)**

and routing the operations among the selected processing devices so that the individual thermal thresholds are not exceeded. **(Figure 3a-3b. Paragraph 34-35)**

Regarding Claim 10:

The reference discloses The method of claim 1, wherein the component includes a plurality of processing devices and the thermal attribute is allocated among the plurality of processing devices. **(Figure 3a-3b. Paragraph 34-35)**

Regarding Claim 11:

The reference discloses The method of claim 1, further comprising determining the thermal attribute by:

(i) determining power consumption of the component; **(Figure 3a-3b. Paragraph 34-35)**

(ii) determining a footprint of the component; **(Figure 3a-3b. Paragraph 34-35)**

(iii) dividing the power consumption of the component by the footprint of the component to obtain per-area power consumption; **(Paragraph 12, 49)**

and (iv) multiplying the per-area power consumption by a thermal estimation constant. **(Paragraph 12, 49)**

Regarding Claim 12:

The reference discloses The method of claim 1, further comprising: determining a cooling attribute;

wherein scheduling the operations incorporates the cooling attribute along with the thermal attribute. **(Paragraph 8)**

Regarding Claim 24:

The reference discloses A processing system comprising:

a computing device including a component; **(Abstract. Figure 11. Paragraph 52)**

a plurality of operations to be performed by the component; **(Abstract. Figure 11. Paragraph 52)**

and at least one thermal attribute associated with the component and a selected one of the operations, the

thermal attribute being indicative of a change in temperature of the component after performance of the selected

operation. **(Abstract. Figure 11. Paragraph 52)**

Regarding Claim 25:

The reference discloses The processing system of claim 24, further comprising a scheduler operable to

assign at least one of the operations to the component depending on the thermal attribute. **(Abstract. Figure 11.**

Paragraph 52)

Regarding Claim 26:

The reference discloses The processing system of claim 25, wherein the scheduler is operable to retrieve a

chosen one of the operations from a storage location depending upon the thermal attribute. **(Abstract. Figure 11.**

Paragraph 52)

Regarding Claim 27:

The reference discloses The processing system of claim 25, wherein the component includes a plurality of

sub-components, the scheduler is a simple scheduler, and the thermal attribute is a total thermal attribute associated

with the component and not associated with the plurality of sub-components. **(Paragraph 9, 51)**

Regarding Claim 28:

The reference discloses The processing system of claim 25, wherein the component includes a plurality of sub-components, the scheduler is an advanced scheduler, and the thermal attribute is further associated with at least some of the sub-components. **(Paragraph 12, 49)**

Regarding Claim 29:

The reference discloses The processing system of claim 25, wherein the component is a processing device and the scheduler is integrated with the processing device. **(Abstract. Figure 11. Paragraph 52)**

Regarding Claim 30:

The reference discloses The processing system of claim 24, wherein the selected operation comprises a task, and the thermal attribute is a task thermal attribute. **(Abstract. Figure 11. Paragraph 52)**

Regarding Claim 31:

The reference discloses The processing system of claim 30, wherein the task thermal attribute is based on at least one of an operating frequency of the component, a thermal attribute of the component, and a cooling attribute. **(Paragraph 8, 39)**

Regarding Claim 32:

The reference discloses The processing system of claim 24, wherein at least some of the operations include a priority, the system further comprising: a plurality of priority queues, wherein each priority queue includes a first queue and a second queue, the first queue for storing a first set of the operations, and the second queue for storing a second set of the operations. **(Paragraph 30)**

Regarding Claim 33:

The reference discloses The processing system of claim 32, further comprising a scheduler operable to assign at least some of the operations to either the first or the second queue in a selected one of the priority queues based on the priorities of the operations and on the thermal attribute. **(Paragraph 30)**

Regarding Claim 34:

The reference discloses The processing system of claim 33, wherein the scheduler is further operable to retrieve a chosen one of the operations from the first queue or the second queue of the selected priority queue depending upon the thermal attribute and the priority of the chosen operation. **(Paragraph 30)**

Regarding Claim 53:

The reference discloses A processing apparatus for processing operations associated with thermal attributes, comprising:

a memory for storing a first operation and a second operation, the first operation having a thermal attribute exceeding an operating threshold, and the second operation having a thermal attribute not exceeding the operating threshold; **(Abstract. Figure 11. Paragraph 52)**

and a plurality of processing devices for executing the first and second operations, at least a selected one of the processing devices comprising a processing element, a processing unit or a sub-processing unit, and at least some of the processing devices having a thermal threshold and access to the memory; **(Abstract. Figure 11. Paragraph 52)**

wherein, if the thermal threshold of the selected processing device is not exceeded, the selected processing device is operable to obtain the first operation from the memory for processing, **(Abstract. Figure 11. Paragraph 52)**

and if the thermal threshold of the selected processing device is exceeded, the selected processing device is operable to obtain the second operation from the memory for processing. **(Abstract. Figure 11. Paragraph 52)**

Regarding Claim 54:

The reference discloses The processing apparatus of claim 53, wherein at least some of the processing devices are processing elements. **(Figure 3a-3b. Paragraph 34-35)**

Regarding Claim 55:

The reference discloses The processing apparatus of claim 54, wherein at least some of the processing elements further comprise at least one sub-processing unit. **(Figure 3a-3b. Paragraph 34-35)**

Regarding Claim 56:

The reference discloses The processing apparatus of claim 55, wherein each sub-processing unit includes a floating point unit, an integer unit and a register associated with the floating point unit and the integer unit. **(Figure 3a-3b. Paragraph 34-35)**

Regarding Claim 57:

The reference discloses The processing apparatus of claim 56, wherein each sub-processing unit further includes a local store. **(Figure 3a-3b. Paragraph 34-35)**

Regarding Claim 58:

The reference discloses The processing apparatus of claim 54, wherein at least some of the processing elements further comprise a processing unit and a plurality of sub-processing units associated with the processing unit. **(Figure 3a-3b. Paragraph 34-35)**

Regarding Claim 59:

The reference discloses The processing apparatus of claim 58, wherein the sub-processing units each further include a local store. **(Figure 3a-3b. Paragraph 34-35)**

Regarding Claim 60:

The reference discloses The processing apparatus of claim 53, wherein a first one of the processing devices is operable to exchange operations with a second one of the processing devices depending upon the thermal threshold of the first processing device. **(Figure 3a-3b. Paragraph 34-35)**

Regarding Claim 61:

The reference discloses The processing apparatus of claim 53, wherein the selected processing device includes a sub-processing unit, and the memory comprises a local store in the sub-processing unit. **(Figure 3a-3b. Paragraph 34-35)**

Regarding Claim 62:

The reference discloses The processing apparatus of claim 61, wherein the local store includes a first queue for managing the first operation and a second queue for managing the second operation. **(Paragraph 30)**

Regarding Claim 63:

The reference discloses The processing device of claim 53, wherein the first and second operations are maintained in the memory in a timesharing arrangement. **(Paragraph 30)**

Examiners Remarks

6.　　i)　　Examiner has cited particular columns and line numbers in the references applied to the claims for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

ii)   The Examiner respectfully requests, in the event the Applicants choose to amend or add new

claims, that such claims and their limitations be directly mapped to the specification, which provides support for the

subject matter. This will assist in expediting compact prosecution.

iii)   Further, the Examiner respectfully encourages Applicants to direct the specificity of their response

with regards to this office action to the broadest reasonable interpretation of the claims as presented. This will avoid

issues that would delay prosecution such as limitations not explicitly presented in the claims, intended use

statements that carry no patentable weight, mere allegations of patentability, and novelty that is not clearly

expressed.

Conclusion
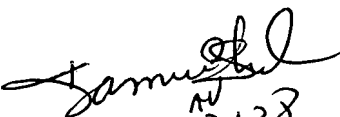
7.   All Claims are rejected.

8.   Any inquiry concerning this communication or earlier communications from the examiner should be

directed to Saif A. Alhija whose telephone number is (571) 272-8635. The examiner can normally be reached on M-

F, 11:00-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah

can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding

is assigned is (571) 273-8300. *Informal or draft communication, please label PROPOSED or DRAFT*, can be

additionally sent to the Examiners fax phone number, (571) 273-8635.

Information regarding the status of an application may be obtained from the Patent Application Information

Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR

or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more

information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the

Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAA

April 28, 2007